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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/519,609	09/21/2005	Dan Rutger Weinholt	P16408US1	9526

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EXAMINER	
FLORES, LEON	

ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/519,609	WEINHOLT, DAN RUTGER	
	Examiner	Art Unit	
	LEON FLORES	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,5,7 and 8* is/are rejected.

7)☒ Claim(s) *3 & 6* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims (1-8) have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims (1-8) are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. While the claims recite a series of steps or acts to be performed, a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. The instant claims neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. In claim 1, applicant fails to explicitly teach what apparatus is implementing this method claim.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. **Claims (1-2, 4-5, 7-8) are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US Patent 5,796,786) in view of Mizoguchi. (US Patent 4,859,956)**

Re claim 1, Lee discloses a Method of demodulating digital data using M'ary QAM, comprising the steps of detecting a complex symbol vector (See fig. 8 & col. 10, lines 35-64), establishing within which reference symbol boundaries the detected symbol vectorD falls, the given reference symbol boundaries being associated with a complex reference vector R (See fig. 8 & col. 10, lines 35-64), establishing quadrature components of an error vector constituting the difference between the detected vector D and the associated reference vector R (See fig. 8 & col. 10, lines 35-64), and seeking to approximate an error control signal as feed back signal in the demodulation stage. (See fig. 8 & col. 10, line 65 – col. 11, line 7)

But the reference of Lee fails to explicitly teach that whereby if the detected symbol vector falls within a first sector in the complex plane surrounding the imaginary axis, the first sector being delimited by at least two lines crossing origin, the first sector being symmetrical with regard to the imaginary axis, approximating the error control

signal by the imaginary quadrature component of the error vector, and whereby if the detected symbol vector falls within a second sector in the complex plane surrounding the real axis, the second sector being delimited by at least two lines crossing origin, the second sector being symmetrical with regard to the real axis, approximating the error control signal by the real quadrature component of the error vector.

However, Mizoguchi does. (See fig. 10 & col. 2, line 21 - col. 3, line 26) Mizoguchi discloses a QAM demodulator capable of estimating the transmitted symbols, whereby if the detected symbol vector falls within a first sector in the complex plane surrounding the imaginary axis *(See fig. 10 "the area surrounding the Q axis")*, the first sector being delimited by at least two lines crossing origin *(See fig. 10 "there are two lines crossing the origin")*, the first sector being symmetrical with regard to the imaginary axis, approximating the error control signal by the imaginary quadrature component of the error vector *("the error is based on estimating the euclidean distance between the reference point and the received point. And is computed based on a well known formula E = square root[$(I-I_R)^2$ + $(Q-Q_R)^2$]. One skilled in the art would know that if the received signal lies in this region, and the ΔQ is much greater than the ΔI the Euclidean distance can be approximated (using well known mathematical procedures) by just the Q component E = square root[$(Q-Q_R)^2$]")*, and whereby if the detected symbol vector falls within a second sector in the complex plane surrounding the real axis (See fig. 10 "the area surrounding the P axis"), the second sector being delimited by at least two lines crossing origin(See fig. 10 "there are two lines crossing the origin"), the second sector being symmetrical with regard to the real axis, approximating the error control

signal by the real quadrature component of the error vector. *("the error is based on estimating the euclidean distance between the reference point and the received point. And is computed based on a well known formula E = square root[(I-I_R)^2 + (Q-Q_R)^2]. One skilled in the art would know that if the received signal lies in this region, and the ΔI is much greater than the ΔQ the Euclidean distance can be approximated (using well known mathematical procedures) by just the Q component E = square root[(I-I_R)^2]")*

Therefore, taking the combined teaching of Lee and Mizoguchi as a whole, it would have been obvious to one of ordinary skills in the art to incorporate these features into the system of Lee, as taught by Mizoguchi and well known mathematical procedures, for the benefit of estimating the transmitted symbol.

Re claim 2, the combination of Lee and Mizoguchi further suggest that whereby the first sector is delimited by the area |D Q|2|D I|and the second sector is delimited by the area |D Q|<|D I|. (In Mizoguchi, see fig. 10)

Re claim 4, the combination of Lee and Mizoguchi further suggest using a weighted error signal, the error signal being a function of the derived error control signal as a feed-back signal in the demodulation stage (In Lee, see fig. 8 & col. 10, line 65 – col. 11, line 7), whereby the weighted error signal - approaches zero for the error control signal approaching zero ("if the error signal is zero the multiplication of the weighting function and the error signal will be zero"), - attains a positive value for positive values of the error control signal close to zero and attains a negative value for negative values

close to zero ("if the error signal is positive the multiplication of the weighting function and the error signal will be positive"), - approaches zero when the error signal vector approaches the symbol boundaries of the detected symbol. (In Lee, see col. 10, line 65 – col. 11, line 7)

Re claim 5, the combination of Lee and Mizoguchi further suggest that wherein if the error signal vector exceeds the symbol boundaries, the weighted error signal attains a reduced value or a zero value. (In Lee, see fig. 6A & col. 8, lines 46-66)

Re claim 7, the combination of Lee and Mizoguchi fails to explicitly teach that wherein no weighting is performed for outer corner portions of the M'ary QAM constellation.

However, the reference of Lee does suggest (See fig. 6A & col. 8, lines 46-66) that wherein no weighting is performed for outer corner portions of the M'ary QAM constellation. ("Weighting function varies depending on the position of the detected symbol")

Therefore, it would have been obvious to one of ordinary skills in the art to incorporate this feature into the system of Lee, as modified by Mizoguchi, in the manner as claimed, for the benefit of reducing the wrong detection of the phase error.

Re claim 8, the combination of Lee and Mizoguchi further suggest that wherein when the detected signal falls outside the symbol boundaries along the Q and I axes, the weighting function WE=0 is applied. (In Lee, see fig. 6A & col. 8, lines 46-66)

Allowable Subject Matter

6. Claims (3 & 6) are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEON FLORES whose telephone number is (571)270-1201. The examiner can normally be reached on Mon-Fri 7-5pm Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. F./
Examiner, Art Unit 2611
January 8, 2009

/David C. Payne/

Supervisory Patent Examiner, Art Unit 2611